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10/698,861

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Miguel Pecters

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EXAMINER

TAYONG, HELENE E

ART UNIT

PAPER NUMBER

2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/698,861

Applicant(s)

PEETERS ET AL.

Examiner

Helene E. Tayong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/3/03.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. Claims 1-26 are objected to because of the following informalities:

(1) In claim 1, lines 4," m" is not define. It is not stated if "m" is an integer or what?

(2) In claim 17, lines 5 and 7, " performing" should be changed to " Providing"

Appropriate correction is required:

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-12 and 14-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Graziano et al.(US 2003/0086486 A1).

(1) with regards to claim 1:

selecting a first noise margin "m" ( **measuring a silence power spectrum**) Fig 1b, 126) relating to an external noise level present in the input communication signal;

selecting a second noise margin "mi" ( **echo signal**) ( fig 1b, 128) relating to an internal noise level generated by the communications system'

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calculating a virtual noise-to-signal ratio (**SNR, the ratio of signal power to noise power**) ( fig 1b, 132) based on an external noise-to-signal ratio  $NSR_e$  (  $P_{noise}$ , power of noise only ) (pg 8, [0180], line 3) , an internal noise-to-signal ratio  $NSR_i$  (  $P_{noise} + \text{signal}$ , power of signal and noise) , said first noise margin (measuring a silence power), and said second noise margin ( echo signal)' and adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin (**SNR<sub>min</sub>**, pg 6, [0132], lines 1-3) above a required noise-to-signal ratio. (step 238, figure 2, pg 5, [0134], lines 20-25)

(2) with regards to claim 2:

wherein said second noise margin "**echo signal**" is a predetermined function of said first noise margin ( pg. 5, [0130], [0131]).

(3) with regards to claim 3:

determining said external noise level (pg. 8, [ 0178, lines 7-10) ;

determining said internal noise level ( pg 8, [ 0178], lines 5-7); and

determining a total noise level based on said estimates of said external noise (fig 2, 226) level and said internal noise level (fig 2, 234, pg. 5, [0126], lines 1-16).

(4) with regards to claim 4:

wherein said step of determining said external noise level comprises the steps of (126, figure 1b):

providing a known periodic signal as the input communication signal (pg. 8, [0178], lines 1-5);

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performing a first noise power measurement with no output communication signal being generated (figure 1a, pg. 8, [ 0178], lines 7-10);

performing a second noise power measurement while the communications system generates the output communication signal corresponding to said pseudo-random input signal (pg. 8, [0178], lines 5-7);

providing a pseudo-random signal as the input communication signal (pg. 20, [0350], lines 1-2);

performing a third noise power measurement while the communications system generates the output communication signal corresponding to said pseudo-random input signal (pg. 20, [0351], lines 4-7);

determining said external noise level by subtracting a known receiver noise floor from said first noise power measurement ( pg. 15, [0271], lines 11-15), (pg. 20, [0354, lines 1-3); and

determining said internal noise level by subtracting the external noise level from said third noise power measurement ( pg. 15, [0271], lines 18-21).

(5) with regards to claim 5:

wherein said virtual noise-to-signal ratio is calculated as a sum of  $NSR_e$ , and a product of:

(i) a ratio of the second noise margin to the first noise margin and (pg. 5, [0126], lines 1-16)

(ii)  $NSR_i$ . (pg. 5, [0126], lines 1-16)

(6) with regards to claim 6:

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wherein said predetermined margin above a required noise-to-signal ratio is equal to said first noise margin  $m$ . (pg. 10, [0200], lines 4-6)

(7) with regards to claim 7:

wherein said first noise margin is always greater than or equal to said second noise margin (pg. 10, [0200], lines 9-13)

(8) with regards to claim 8:

selecting a target margin corresponding to said first noise margin at an initial time; and (  $t_{crsc}$ , figure 1d, pg 5, [0125], lines 7-10)

selecting a target internal margin corresponding to said second noise margin at said initial time, (  $t_{crsr}$ , figure 1d, pg 5, [0125], lines 7-10)

wherein said target internal margin is a predetermined function of said target margin (  $t_{crsc}$ , figure 1d, pg 5, [0125], lines 7-10).

(9) with regards to claim 9:

wherein said first noise margin and said second noise margin are selected such that said first noise margin remains stable in the presence of one or more measurement errors (pg 11, [0225] ,(37)).

(10) with regards to claim 10:

wherein the communications system is a multiple carrier communications system having a plurality of carrier channels ( (G.SHDSL) pg. 4, [0118] ,lines 1-4).

(11) with regards to claim 11:

selecting said first and second noise margins for each said carrier channel (pg. 8, [0178], lines 7-10); and

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adaptively equalizing said first and second noise margins across all of said carrier channels via real time adjustment of said at least one operating parameter ( pg. 15, [0272, lines 1-2, [0273], lines 6-9)..

(12) with regards to claim 12:

wherein said second noise margin is a function of a mean first noise margin for the plurality of carrier channels (pg. 14, [0262], lines 1-3).

(14) with regards to claim 14:

means for setting a first noise margin  $m$  relating to an external noise level present in the input communication signal (figure 1a, pg. 8, [ 0178]- lines 5-7]

means for setting a second noise margin  $m_i$  relating to an internal noise level generated by the communications system ( figure 1a, pg 8, [ 0178], lines 7-10)

means for calculating a virtual noise-to-signal ratio (**SNR, the ratio of signal power to noise power**) based on an external noise-to-signal ratio  $NSR_e$ , an internal noise-to-signal ratio  $NSR_i$ , said first noise margin, and said second noise margin; and (pg. 5, [ 0126], lines 1-16)

means for adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin (**SNR<sub>min</sub>**, pg 6, [0132], lines 1-3) above a required noise-to-signal ratio (step 238, figure 2, pg. 5, [0134], lines 20-25).

(15) with regards to claim 15:

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wherein said means for setting said second noise margin establishes said second noise margin as a predetermined function of said first noise margin (pg. 5, [0130], [0131]).

(16) with regards to claim 16:

means for determining said external noise level (pg. 8, [ 0178, lines 7-10) ;  
means for determining said internal noise level ( pg. 8, [ 0178], lines 5-7); and  
means for determining a total noise level based on said estimates of said external noise level and said internal noise level (pg. 5, [0126], lines 1-16).

(17) with regards to claim 17:

wherein said means for determining said external noise level comprises:

means for providing a known periodic signal as the input communication signal (pg. 8, [0178], lines 7-10);

means for performing a first noise power measurement with no output communication signal being generated (figure 1a, pg. 8, [ 0178], lines 5-7);

means for performing a second noise power measurement while the communications system generates the output communication signal corresponding to said known periodic input signal (pg. 8, [0178-0181]);

means for providing a pseudo-random signal (ITU G.991.2) as the input communication signal (pg. 20,[0350, lines 1-2, [0351], lines 6-7);

means for performing a third noise power measurement while the communications system generates the output communications signal corresponding to said pseudo-random input signal (pg. 21, [0355], lies 1-6);

means for determining said external noise level by subtracting a known



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receiver noise floor from said first noise power measurement ( pg. 15, [0271], lines 11-15), (pg. 20, [0354, lines 1-3); and

means for determining said internal noise level by subtracting the external noise level from said third noise power measurement ( pg.15, [0271], lines 18-21).

(18) with regards to claim 18:

wherein said means for calculating said virtual noise-to-signal ratio calculates said virtual noise-to-signal ratio as a sum of NSRe, and a product of:

(i) a ratio of the second noise margin to the first noise margin (pg. 5, [0126], lines 1-16) and

(ii) NSRi (pg. 5, [0126], lines 1-16).

(19) with regards to claim 19:

wherein said predetermined margin above a required noise-to-signal ratio is equal to said first noise margin m (pg. 10, [0200], lines 5-7).

(20) with regards to claim 20:

wherein said first noise margin is always greater than or equal to said second noise margin (pg. 10, [0200], lines 9-13)

(21) with regards to claim 21:

means for selecting a target margin corresponding to said first noise margin at an initial time (  $t_{crsc}$ , figure 1d, pg. 5, [0125], lines 7-9) ; and

means for selecting a target internal margin corresponding to said second noise margin at said initial time (  $t_{crsr}$ , figure 1d, pg.5, [0125], lines 7-9),

wherein said target internal margin is a predetermined function of said

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target margin (  $t_{crsc}$ , figure 1d, pg. 5, [0125], lines 7-9).

(22) with regards to claim 22:

wherein said first noise margin and said second noise margin are set such that said first noise margin remains stable in the presence of one or more measurement errors (pg. 11, [0225], (37)).

(23) with regards to claim 23:

wherein the communications system is a multiple carrier communications system having a plurality of carrier channels ((G.SHDSL, HDSL.2), [0192], pg. 10, lines 1-2).

(24) with regards to claim 24:

means for selecting said first (figure 1a, pg. 8, [ 0178]- lines 5-7) and second noise margins ( pg.8, [ 0178], lines 5-7) for each said carrier channel ((G.SHDSL, HDSL.2), [0192], pg. 10, lines 1-2); and

means for adaptively equalizing said first and second noise margins across all of said carrier channels via real time adjustment of said at least one operating parameter (pg. 15, [0272, lines 1-2, [0273], lines 6-9).

(25) with regards to claim 25:

wherein said second noise margin is a function of a mean first noise margin of the plurality of carrier channels (pg. 14, [0262], lines 1-3).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

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be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graziano et al. (US 2003/0086486 A1) in view of Steele (IEEE Transaction on Communications, vol. 28, No. 12, Dec. 1980).

(1) with regards to claims 13 and 26:

Graziano et al. discloses a method and system having all the features claimed as described above, except a formula that gives an internal margin of 2dB for the initial target margin. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the formula (34) and (35) on page 1981 in Steele (IEEE Transaction on Communications, vol. 28, No. 12, Dec. 1980) to derive formula recited in claims to calculate internal margin in dB. SNR margin is expressed in dB and is represented as the level of additional noise that the system can tolerate before violating the required bit error rate (BER) of the system. It measures a communications system's immunity to noise. For example, an SNR margin of 3 dB means that if the noise level were increased by 3 dB, the system would be subject to excessive errors. A SNR of zero indicates that the desired signal is virtually indistinguishable from the unwanted noise. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Graziano et al. ( US 2003/0086486 A1) discloses a method and system for determining maximum power backoff for operating modems using frequency domain geometric signal to noise ratio.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene E. Tayong whose telephone number is (571) 270-1675. The examiner can normally be reached on Monday - Friday 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Helene Tayong

1/17/07



**SHUWANG LIU**  
**SUPERVISORY PATENT EXAMINER**